

A 2Y

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/692,619	ZHANG ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Lawrence B. Williams	2611	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**  
All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendments filed on 12 December 2006.

2. ☒ The allowed claim(s) is/are 2-21, renumbered as 1-20, respectively.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of the:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).  
\* Certified copies not received: \_\_\_\_\_

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.  
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached  
1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.  
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.  
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	5. <input type="checkbox"/> Notice of Informal Patent Application
2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____
3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____	7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment
4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material	8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance
	9. <input type="checkbox"/> Other _____

U.S. Patent and Trademark Office  
PTOL-37 (Rev. 08-06)

Notice of Allowability

Part of Paper No./Mail Date 1

Art Unit: 2611

### **TERMINAL DISCLAIMER**

1. The terminal disclaimer filed on 12 December 2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US Patent 6,721,279 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### **DRAWINGS**

2. The drawings were received on 12 December 2006. These drawings are accepted by the examiner.

### REASONS FOR ALLOWANCE

1. The following is an examiner's statement of reasons for allowance: The instant application discloses systems, which compensate for the presence of digital impairments using adaptive constellation techniques. The closest prior art of record is applicant's US Patent 6,721,279 for which a Terminal Disclaimer has been filed. A search of prior art records has failed to teach or suggest alone or in combination:

“an error minimization method for use by a first modem to create a constellation, said method comprising: training an equalizer to yield tap values; receiving a sequence including a plurality of segments, each of said plurality of segments having a sign pattern; arranging said plurality of segments into a plurality of signal vectors; selecting level estimates to minimize a sum of squared errors, wherein said errors are based on differences between said signal vectors and a product of said tap values, values of said sign pattern and said level estimates; and defining said constellation based on said level estimates” as disclosed in claim 2.

“a modem capable of error minimization for creating a constellation, said modem comprising: an equalizer configured to yield tap values; a receiver configured to receive a sequence including a plurality of segments, each of said plurality of segments having a sign pattern; wherein said modem arranges said plurality of segments into a plurality of signal vectors, selects level estimates to minimize a sum of squared errors, wherein said errors are based on differences between said signal vectors and a product of said tap values, values of said sign pattern and said level estimates, and defines said constellation based on said level estimates” as disclosed in claim 7.

Art Unit: 2611

“ an error minimization method for use by a first modem to create a constellation, said method comprising: training an equalizer to yield tap values; receiving a sequence including a plurality of segments, each of said plurality of segments having a sign pattern; arranging said plurality of segments into a plurality of signal vectors; selecting level estimates to minimize a sum of squared errors, wherein said errors are based on differences between said signal vectors and a first product of said tap values, values of said sign pattern, said level estimates and error values, wherein said error values are based on differences between said signal vectors and a second product of said tap values, values of said sign pattern and previous or current said level estimates; and defining said constellation based on said level estimates” as disclosed in claim 12.

“a modem capable of error minimization for creating a constellation, said modem comprising: an equalizer configured to yield tap values; a receiver configured to receive a sequence including a plurality of segments, each of said plurality of segments having a sign pattern; wherein said modem arranges said plurality of segments into a plurality of signal vectors, selects level estimates to minimize a sum of squared errors, wherein said errors are based on differences between said signal vectors and a first product of said tap values, values of said sign pattern, said level estimates and error values, wherein said error values are based on differences between said signal vectors and a second product of said tap values, values of said sign pattern and previous or current said level estimates, and said modem defines said constellation based on said level estimates” as disclosed in claim 17.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

Art Unit: 2611

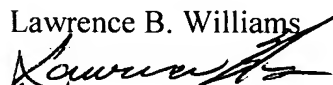
fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### CONCLUSION

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 571-272-3037. The examiner can normally be reached on Monday-Friday (8:00-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ghayour Mohammad can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams  
  
lbw  
December 16, 2006

  
EMMANUEL BAYARD  
PRIMARY EXAMINER